Update on Nebraska Water Planning Initiatives

NeFSMA Spring Meeting
May 6, 2015
Scottsbluff, Nebraska

Jesse Bradley, PG
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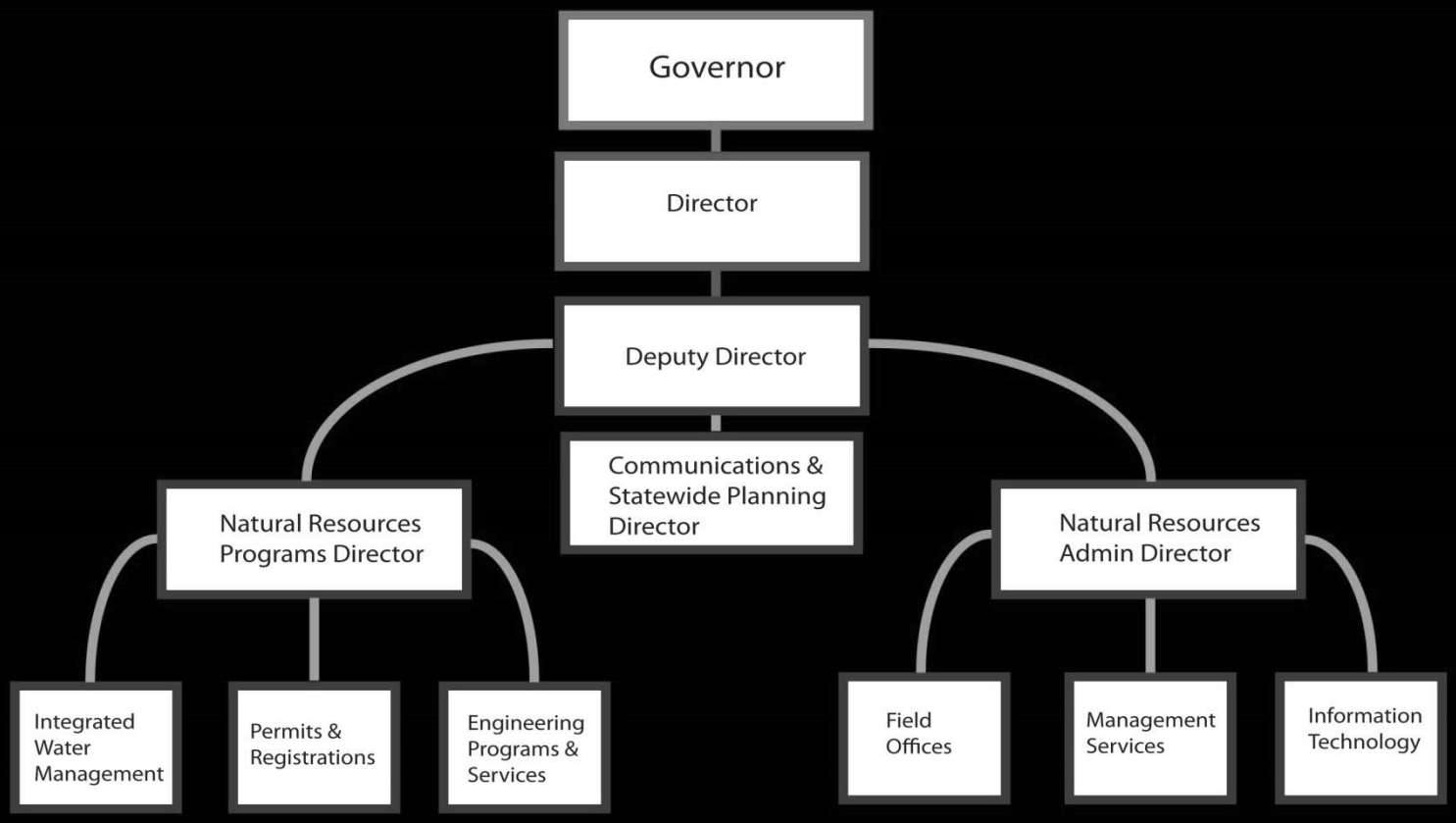
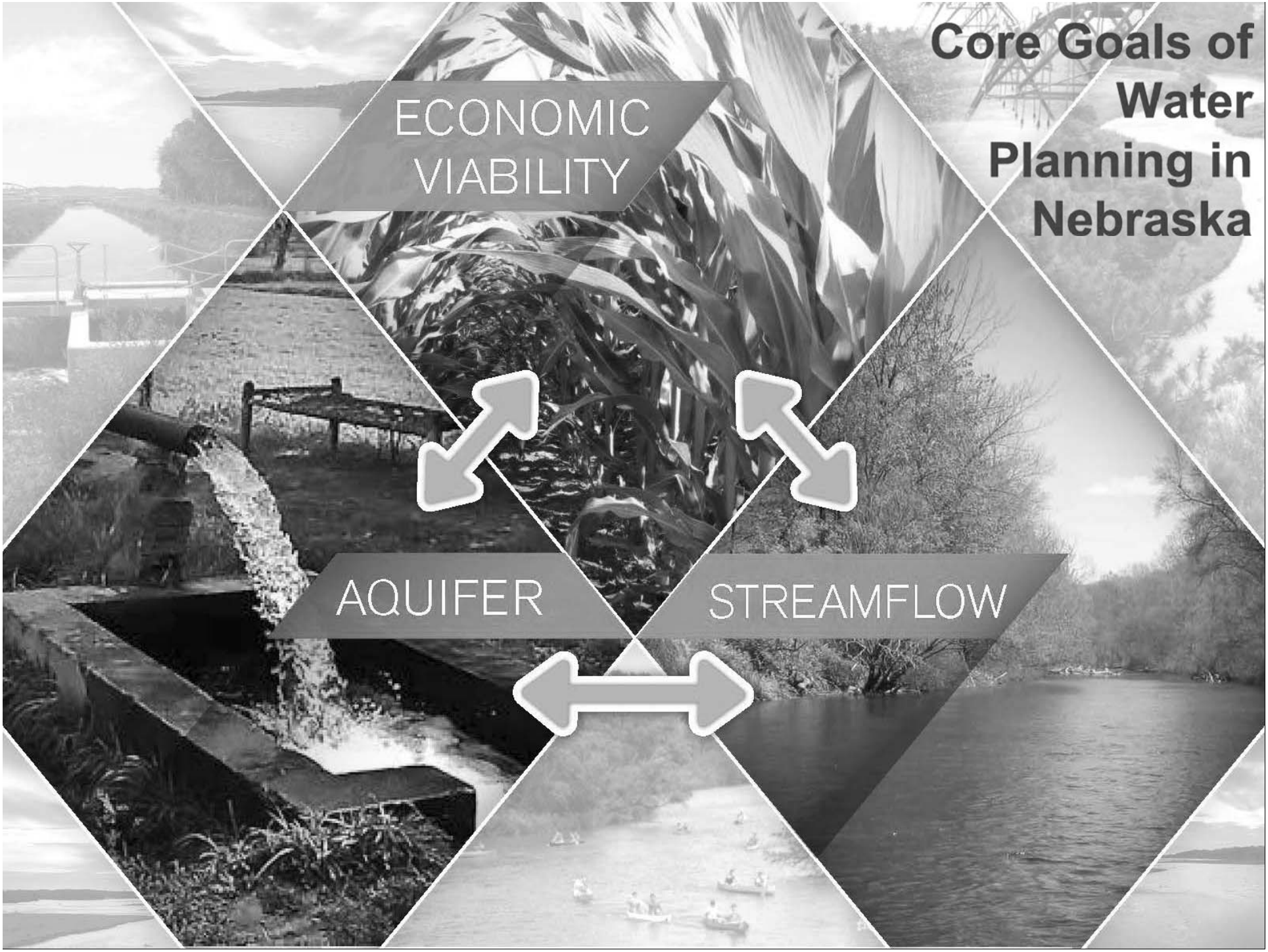


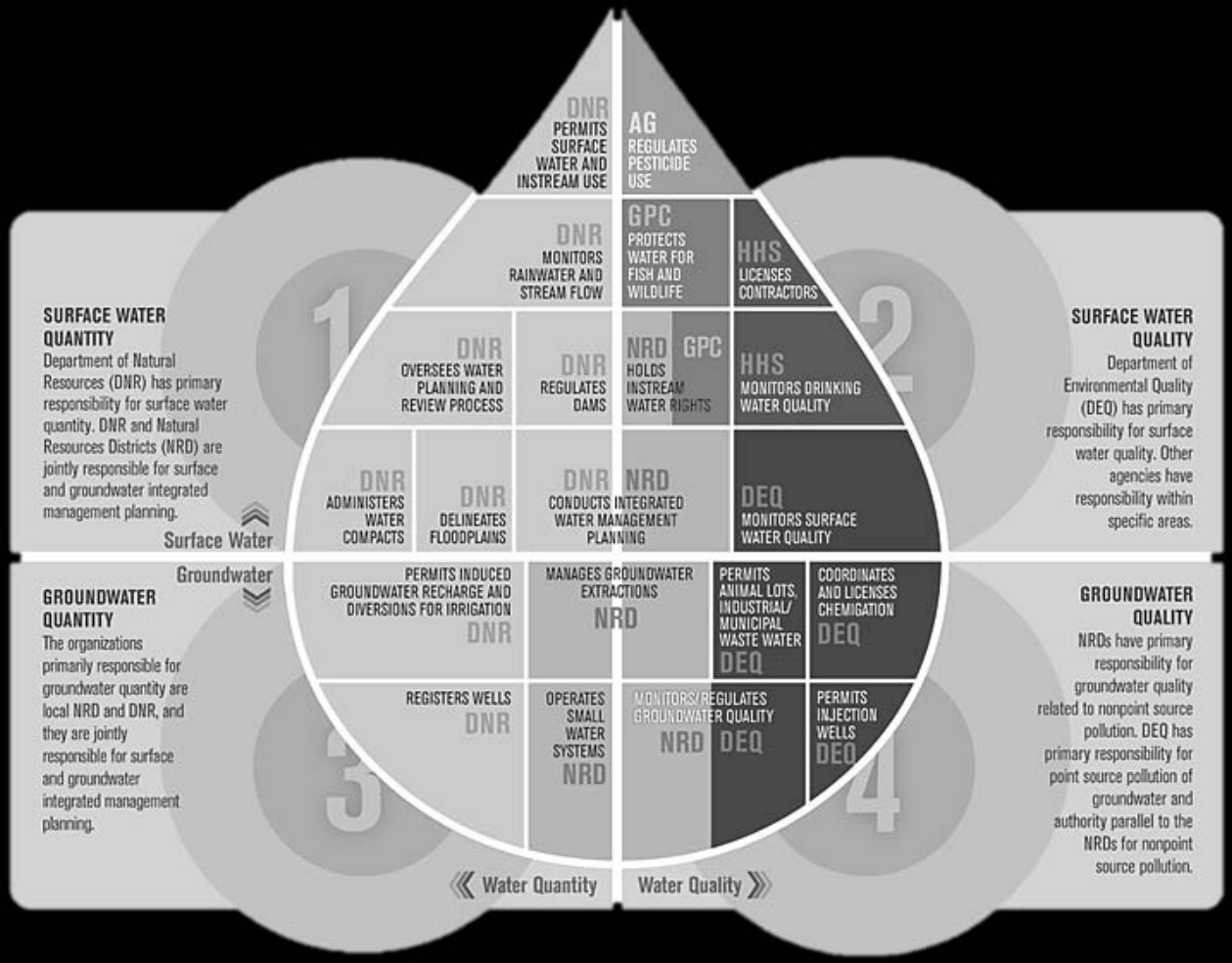
Overview

- Water Planning Activities Across the State
- Diverting Floodwaters for Aquifer Recharge
- Sustainability Funding to Support Planning Implementation
- Summary

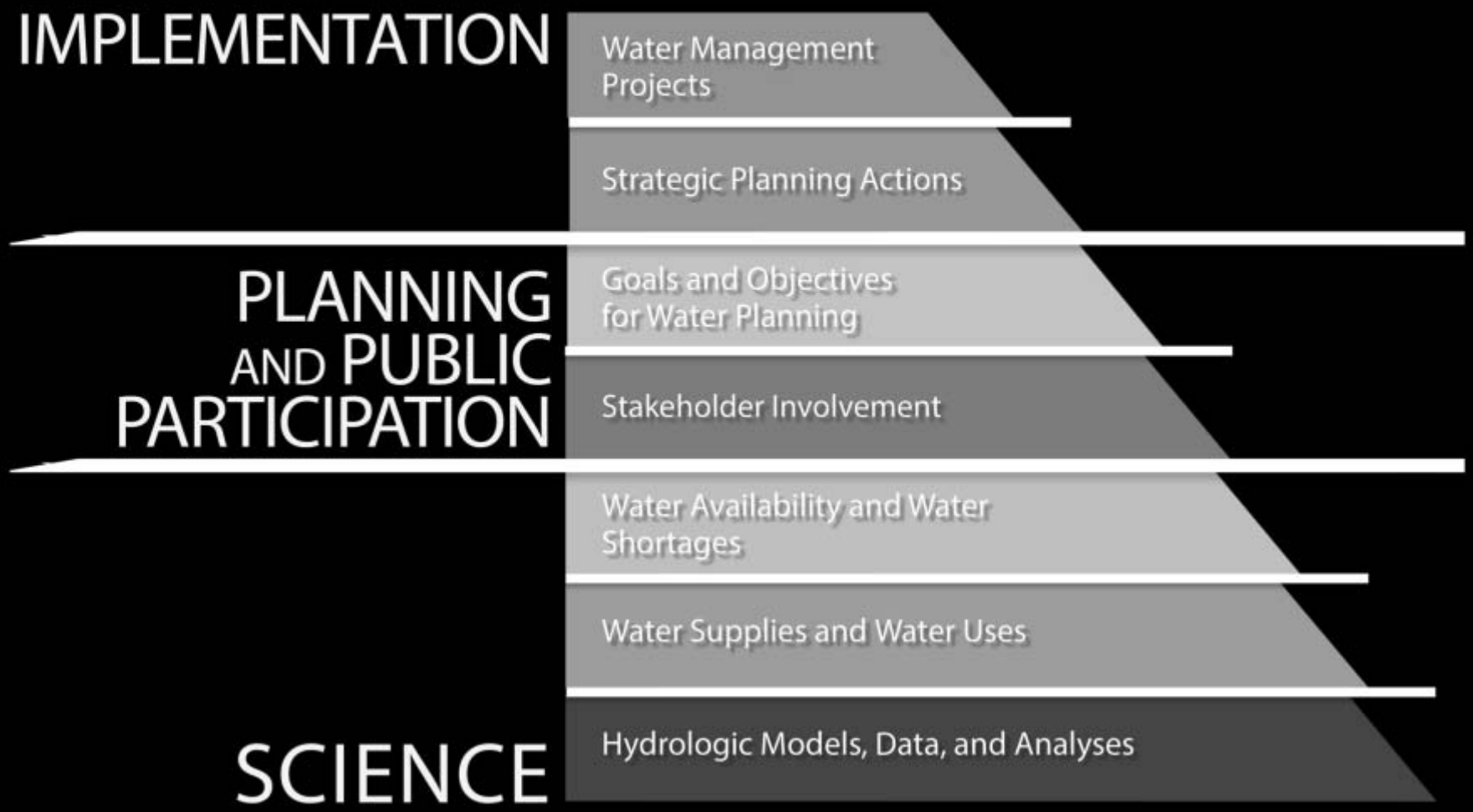
Water Planning Update


Core Goals of Water Planning in Nebraska
ECONOMIC VIABILITY
AQUIFER
STREAMFLOW

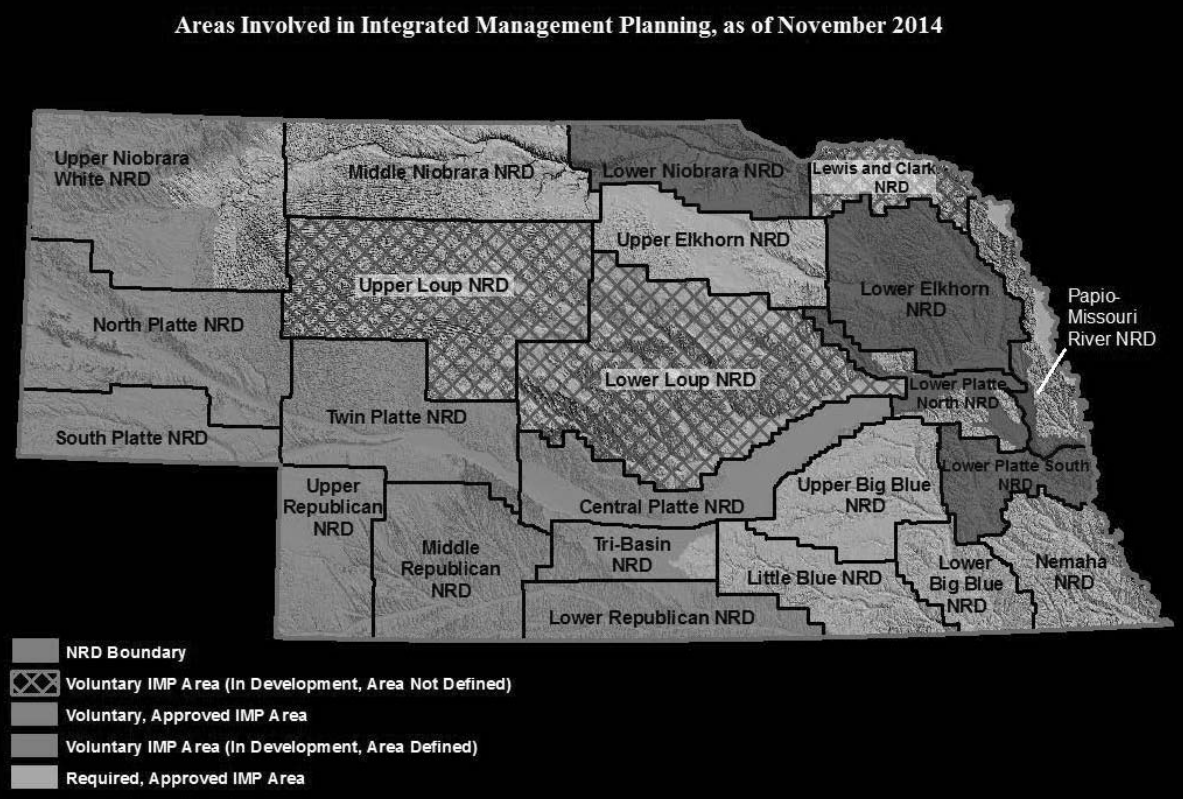
State Water Planning



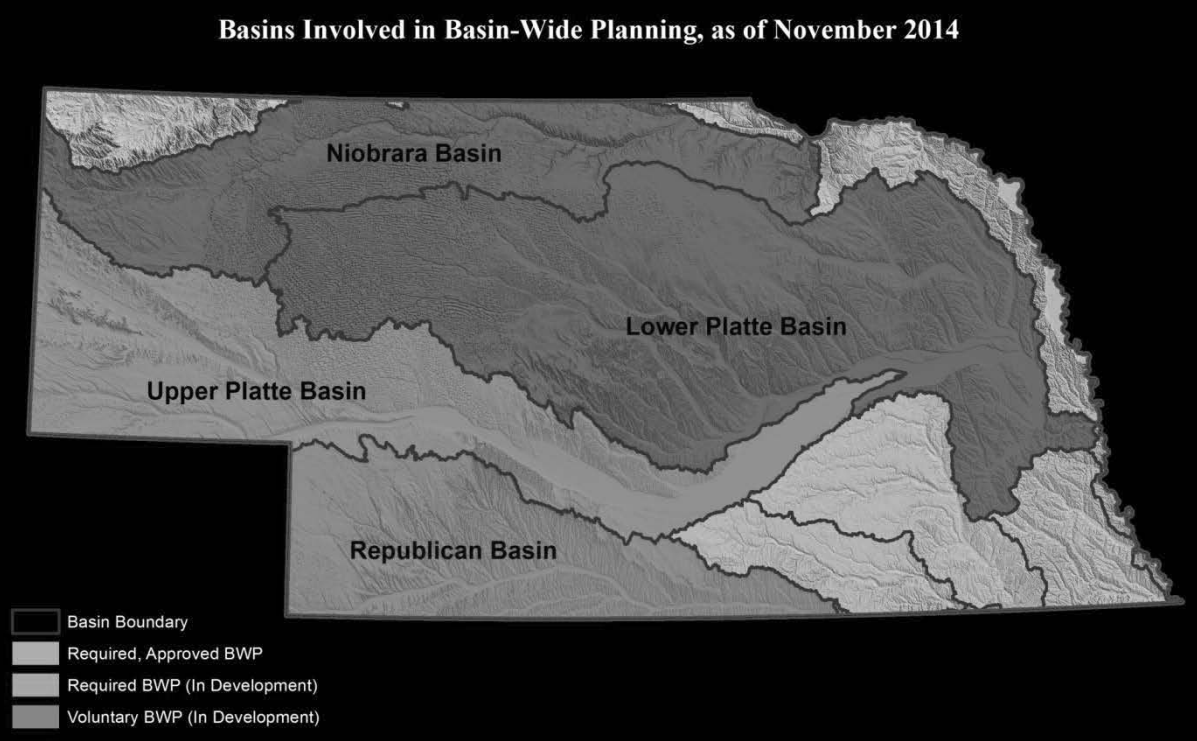
Integrated Water Management



Areas involved in Integrated Management Planning
(as of November 2014)



Basins involved in Basin-Wide Planning
(as of November 2014)



Recent and Upcoming Activities
Statewide

SCIENCE

- Identification of irrigated / non-irrigated acres for 2010 and 2015 (remote sensing)
- 2010 land use classification, with CALMIT
- Water use data improvements
- Stream gaging enhancements
- INSIGHT

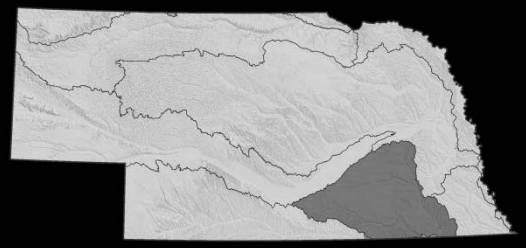
PLANNING AND PUBLIC PARTICIPATION

- Integrated Management Plans
- Basin-wide plans
- Improved lines of communication amongst agencies and stakeholders

IMPLEMENTATION

- Through local integrated management plans and basin-wide plans
- WRCF Projects

Recent and Upcoming Activities
Blue Basin



SCIENCE

- Blue Model
- Water Use Data Collection Improvements

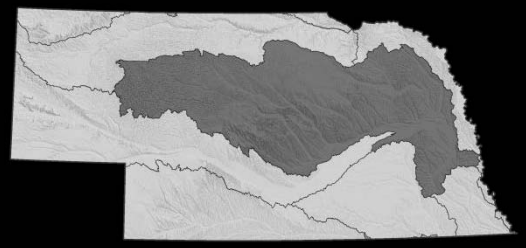
PLANNING AND PUBLIC PARTICIPATION

- Upper Big Blue NRD IMP completed by its impacts on Central Platte River
- Little Blue NRD
  - Expressed interest in learning more about IMPs

IMPLEMENTATION

- IMP controls
- Joint projects not currently identified

Recent and Upcoming Activities
Lower Platte Basin



SCIENCE

- ENWRA
- CENEB
- Lower Platte / Missouri Tributaries Model (Phase I)
  - In development
    - Water Use Data Collection Improvements
    - INSIGHT

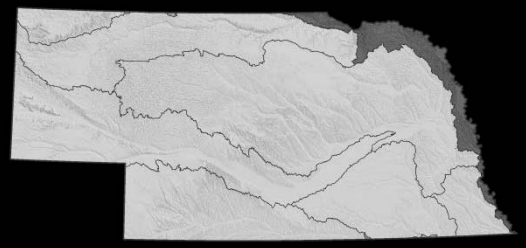
PLANNING AND PUBLIC PARTICIPATION

- Basin-wide plan
  - In development
- IMPs
  - In development:
    - Lower Elkhorn NRD
    - Lower Loup NRD
    - Lower Platte North NRD
    - Upper Loup NRD
  - Adopted:
    - Lower Platte South NRD (May 2014)
    - Papio-Missouri River NRD (Aug. 2014)

IMPLEMENTATION

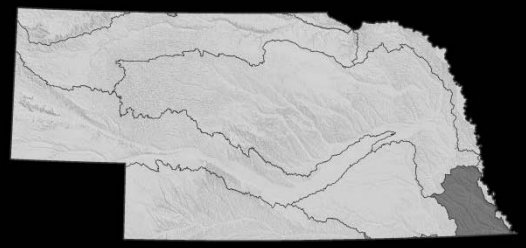
- Lower Platte South NRD
  - First annual IMP meeting
  - Drought Emergency Response Plan
  - Data gap analysis
- Papio-Missouri River NRD
  - First annual IMP meeting

Recent and Upcoming Activities
Missouri Tributaries Basins



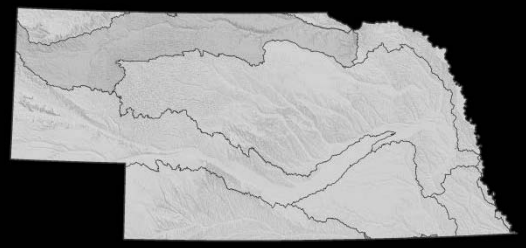
SCIENCE	PLANNING AND PUBLIC PARTICIPATION	IMPLEMENTATION
• Lower Platte / Missouri Tributaries Model (Phase I) – In development • Water Use Data Collection Improvements • INSIGHT	• Lewis and Clark NRD IMP – In development	• No joint actions identified to date

Recent and Upcoming Activities
Nemaha Basin



SCIENCE	PLANNING AND PUBLIC PARTICIPATION	IMPLEMENTATION
• Lower Platte / Missouri Tributaries Model (Phase II) – In development • Water Use Data Collection Improvements • INSIGHT	• No integrated management plan currently in development	• No joint actions identified to date

Recent and Upcoming Activities
Niobrara Basin



SCIENCE

- Upper Niobrara-White Model
  - Scenario modeling underway
- WaterSMART
  - Final report nearing completion
  - Water Use Data Collection Improvements
  - INSIGHT

PLANNING AND PUBLIC PARTICIPATION

- Basin-wide plan
  - In development
- IMPs
  - In development:
    - Middle Niobrara NRD
  - Adopted:
    - Lower Niobrara NRD (May 2014)

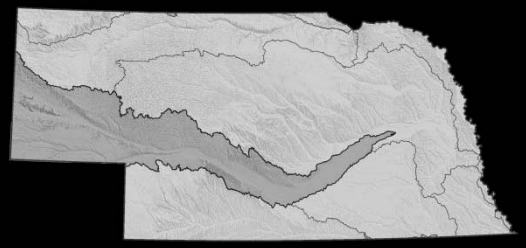
IMPLEMENTATION

- Lower Niobrara NRD
  - First annual IMP meeting
  - “Townhall” meeting on water topics (education and outreach)

Recent and Upcoming Activities
Republican Basin

SCIENCE	PLANNING AND PUBLIC PARTICIPATION	IMPLEMENTATION
• RRCA model • Solid foundation of water use data • Basin Study • Conjunctive Management Evaluation	• Basin-wide plan – In development • IMPs – New plans for basin NRDs in discussion	• Augmentation projects: – N-CORPE – Rock Creek augmentation wells • Improvements to NRD groundwater well meter database • Improving State Relations

Recent and Upcoming Activities
Upper Platte Basin



SCIENCE

- Conservation study
- Robust review analysis
- OA/FA analysis
- COHYST
- WWUM
- New telemetry stations
- Remote sensing landuse Data

PLANNING AND PUBLIC PARTICIPATION

- Five IMPs currently in place
- Basin-wide plan
  - In discussion, with planned start-up in 2016

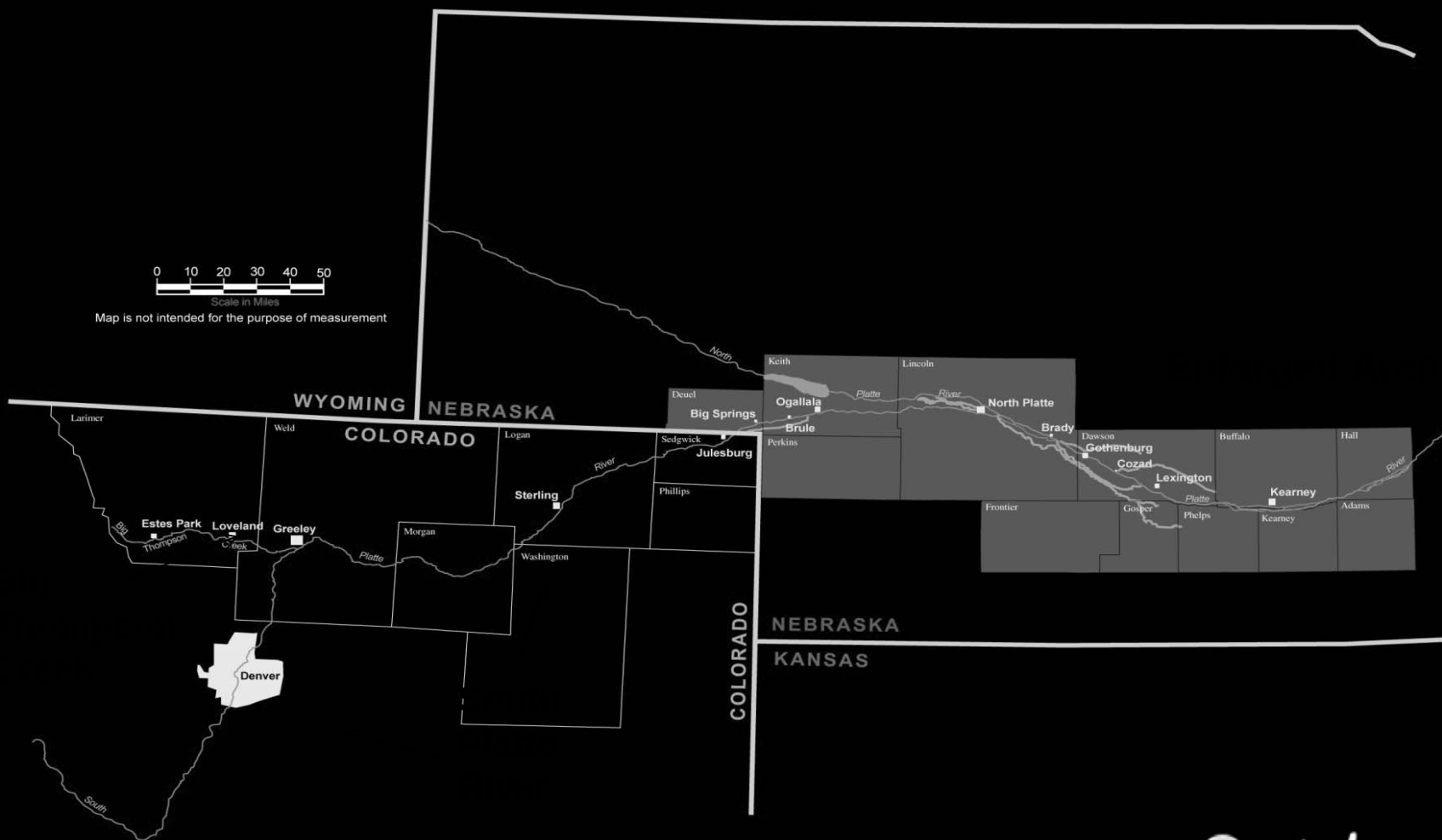
IMPLEMENTATION

- Central Platte NRD
  - Water market program, in development
- Augmentation projects
  - N-CORPE
  - Augmentation wells in Tri-Basin NRD
- Conjunctive management
  - Cozad, 30-mile, and Orchard-Alfalfa canals
  - J-2 Regulating Reservoir, land acquisition stage

Using Excess Flows for Recharge

Case Study: 2013 South Platte River Flooding

Background



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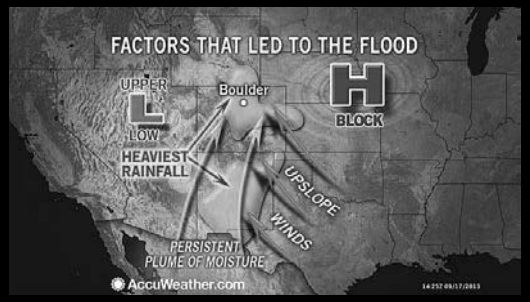
Flooding Begins in Colorado



- **Week-long precipitation event in Colorado from September 9 – 16, 2013**
- **Stream gages are washed away from bridges in Colorado**
- **Unknown floodwaters headed to Nebraska**

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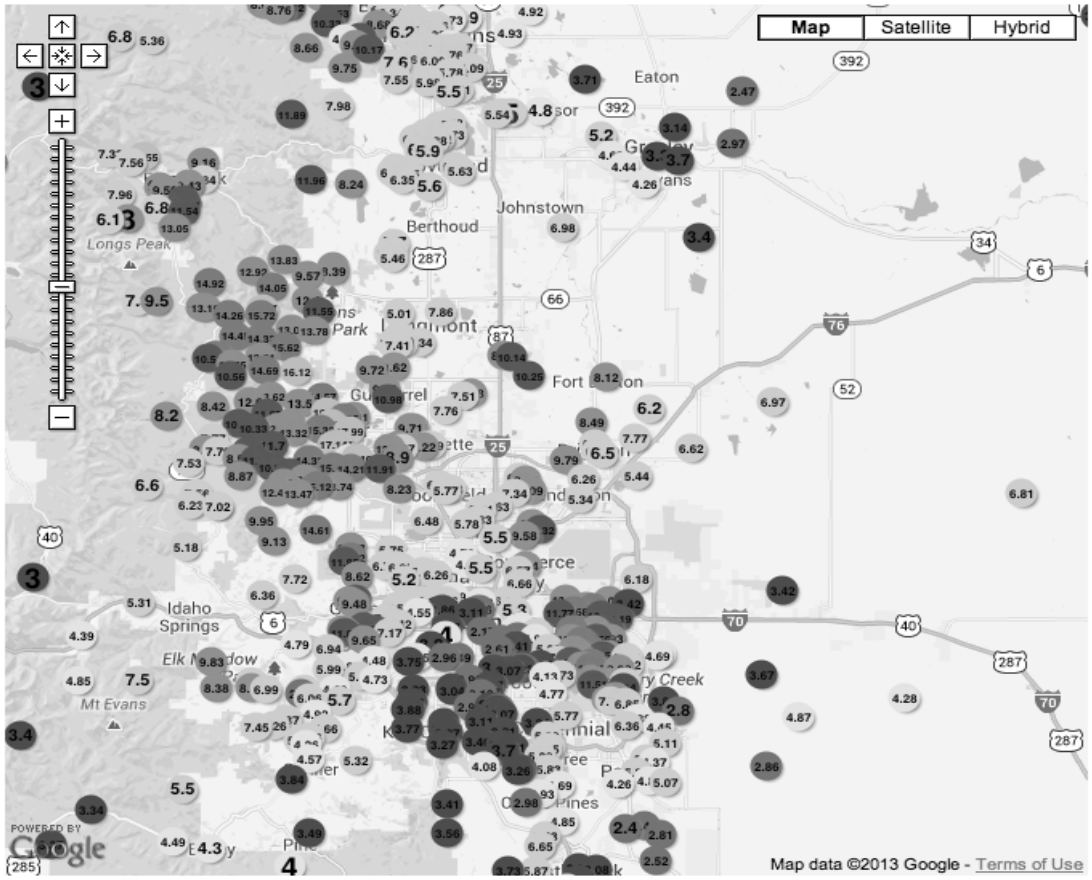
Precipitation Total in Colorado

Precipitation Totals - 7 Day Totals - Sept 9th thru Sept 15th (2013)

Precip Legend <0.5" <1.0" <2.0" <3.0" <4.0" <5.0" <6.0" <8.0" <10.05" <12.0" <14.0" <16.0" >=18.0"



- Boulder 3.3 SE(18.13)
- Boulder 1.8 ESE(17.99)
- Riverside 2.2 NE(17.77)
- Boulder 1.6 S(17.14)
- Boulder 2.9 S(17.07)
- Boulder 1.3 NW(17.02)
- Black Canyon(16.55)
- Boulder 1.5 NW(16.54)
- S_Boulder_Ditch (16.46)
- Lazy_Acres (16.12)
- Boulder 0.5 NNE(15.85)
- RALSTON RSVR(15.72)
- Conifer_Hill (15.72)
- Aurora 4.2 NNW(15.68)
- Aurora 4.0 N(15.68)
- Fairview_Peak (15.62)
- Virginia_Court (15.42)
- Justice_Center (15.32)
- Shanahan_Ridge (15.31)
- Aurora 0.7 WSW(15.2)
- Red_Garden (15.12)
- Aurora 4.1 S(14.93)

NOTE: Marker locations are approximate and are not accurate to street level

Department Preparation

- Peak flow determined in Colorado by Bridgeport Field Office
- Department floodplain managers developed potential flood inundation maps
  - Forecast flood stages
  - LiDAR & USGS topographic data
- Provide maps to Nebraska Emergency Management Agency and local governments
- Working with Irrigation Districts to Divert Floodwaters

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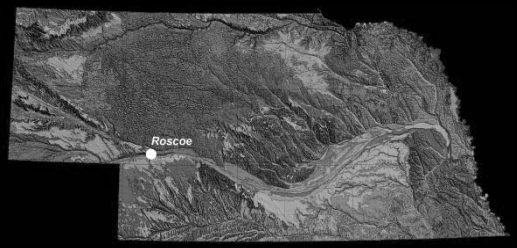

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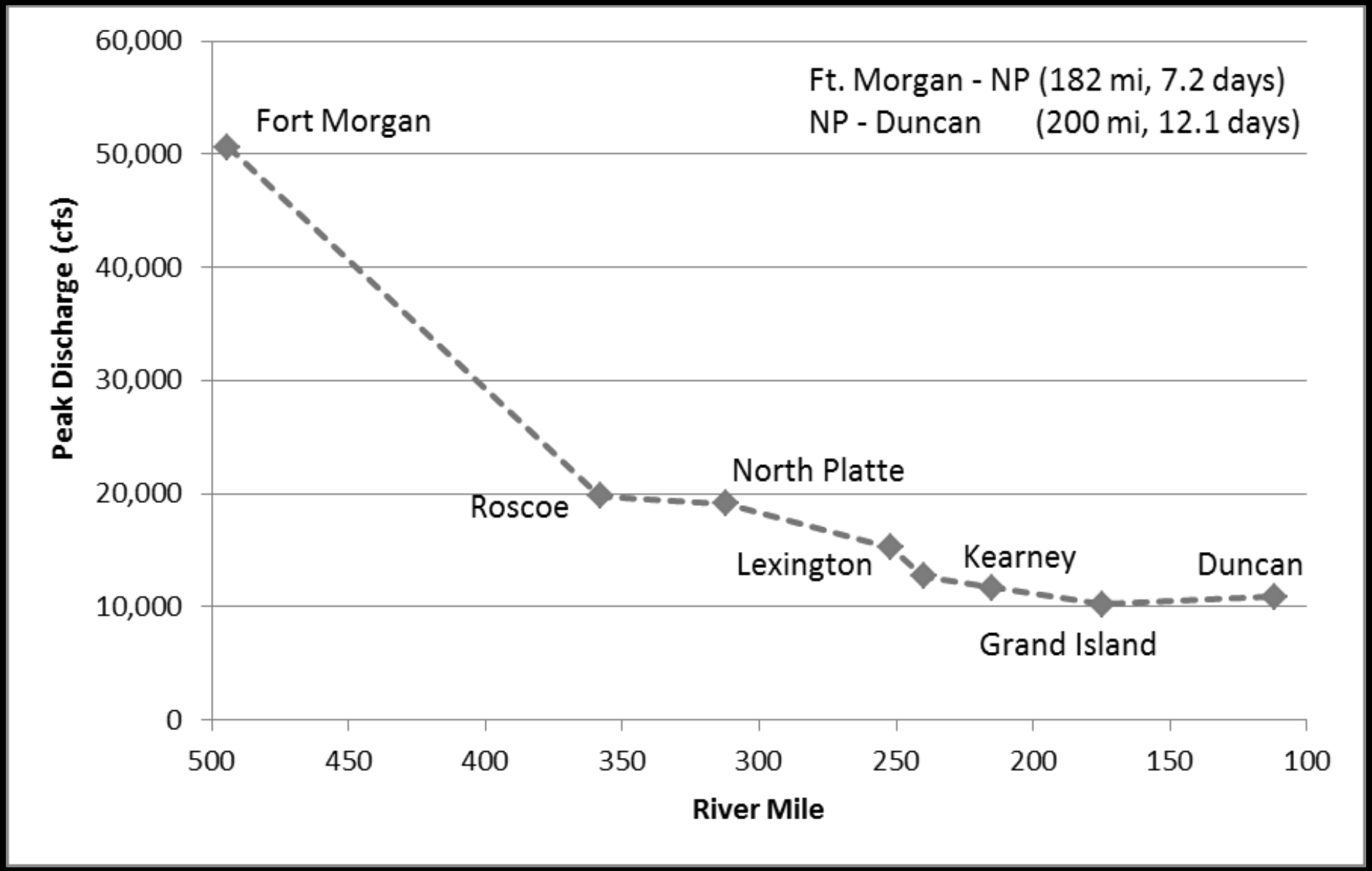

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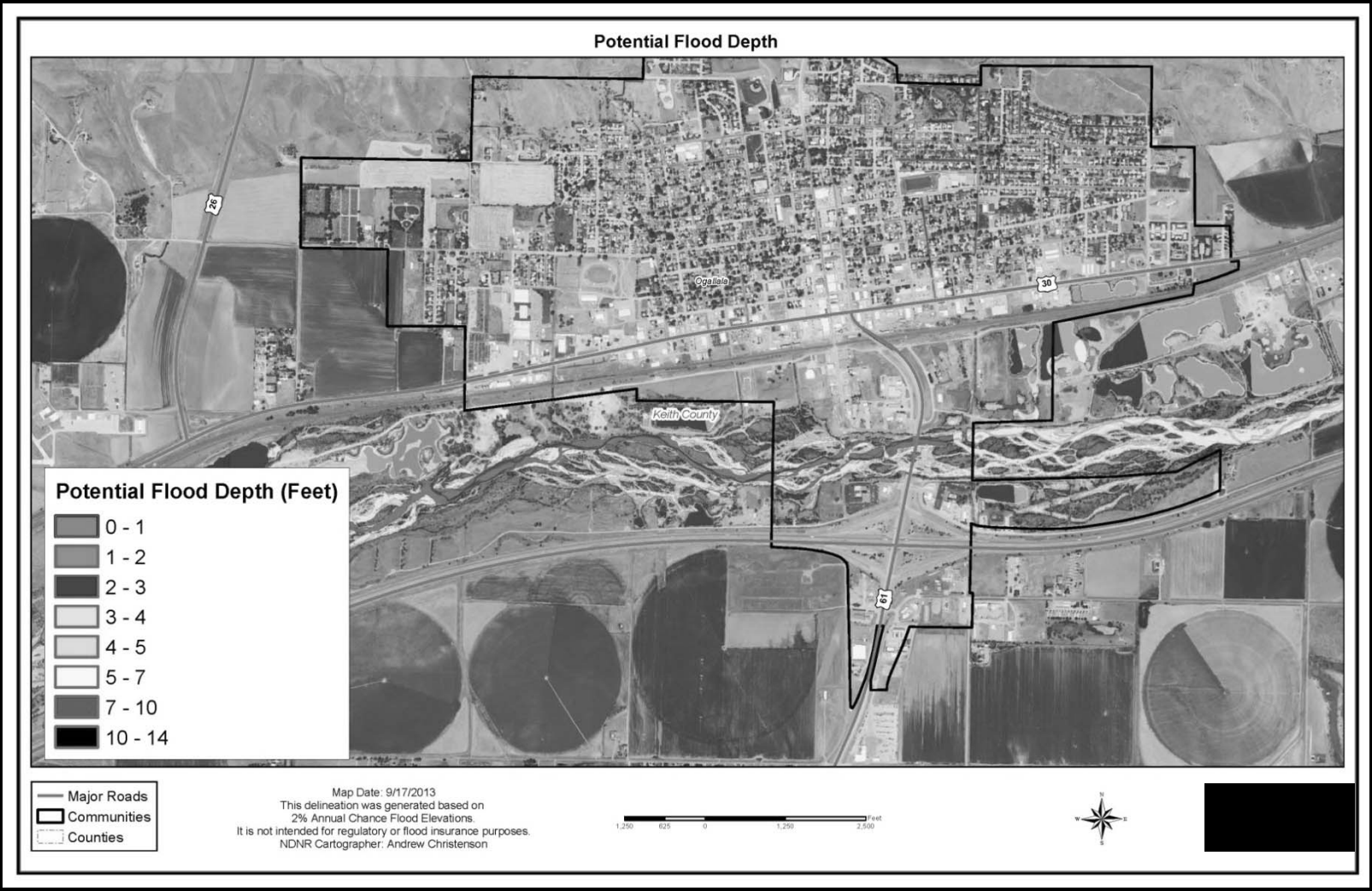
Potential Flood Inundation Depth Map



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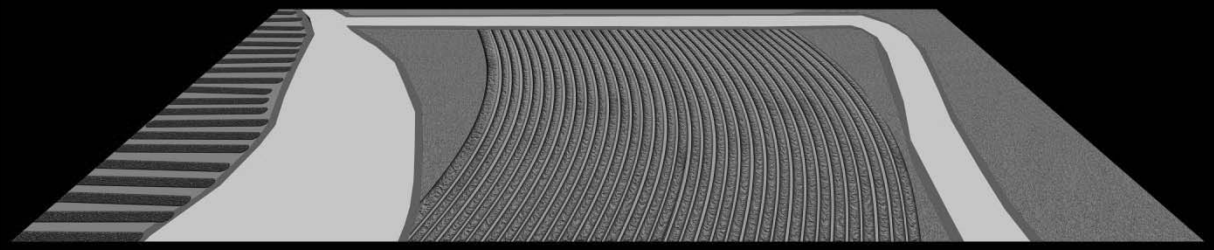
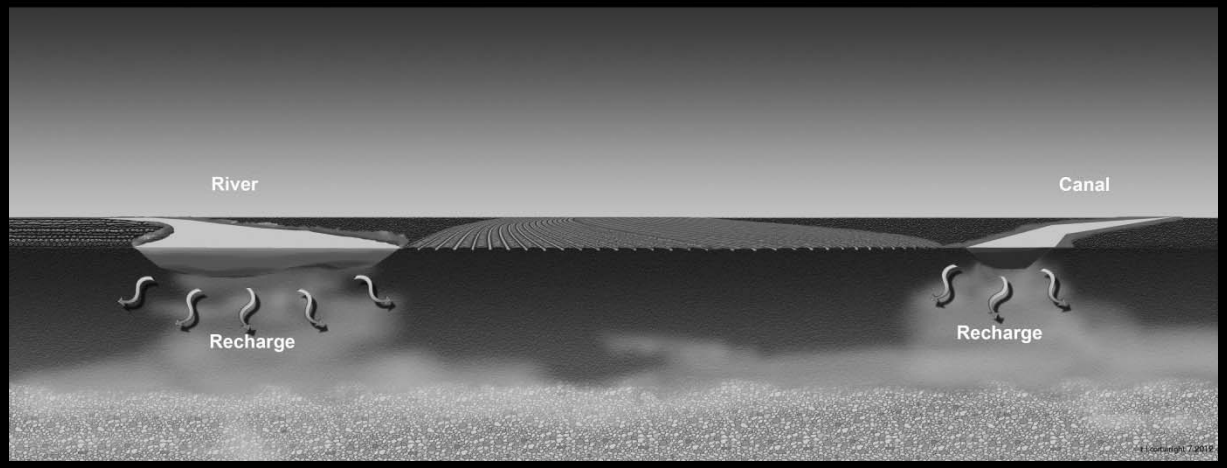
Diverting Floodwaters for Recharging the Aquifer





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Flood Flow Diversion Management

- Collaborative effort
- Contact potential partners to divert floodwaters
    - Canals
    - Irrigation Districts
- Agreements developed quickly with partners
- Coordinate timing of diversions
- Potential to provide beneficial recharge

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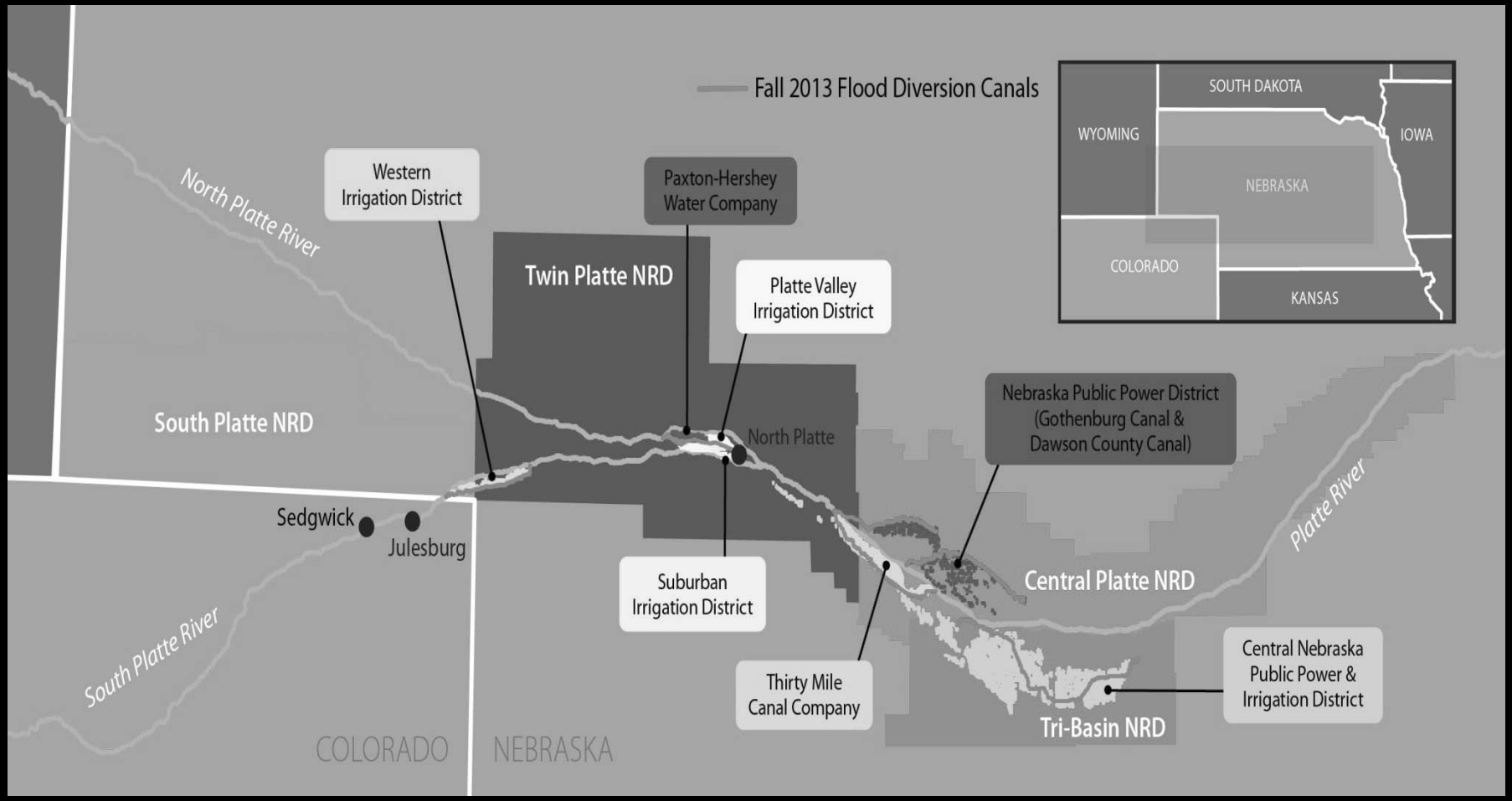
Diversions of Fall 2013 Floodwaters



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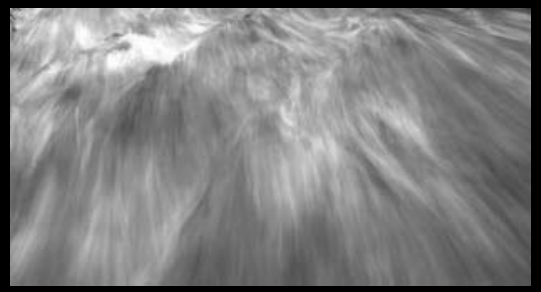
2013 South Platte Flooding



- Total Diverted (9/15 to 10/31/2013) 44,100 AF
- Estimated Total Recharged 29,900 AF
- Total Cost $707,748
- Cost per Acre-foot $24

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Before the Flood Event

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26 Hours Later - The Flood Event

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Water Sustainability Fund

Background

- Created by Legislature in 2014 to provide grants and loans for water research, planning and infrastructure in Nebraska
- Expanded the Nebraska Natural Resources Commission from 16 to 27 members to ensure a broad representation
- Initial funding totaled $21 million in FY2015, with intent language that $11 million per year be appropriated each year thereafter

Notes:
$1.1 million per year reserved for sewer water separation projects

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Goals of Fund

1. Provide financial assistance to programs, projects, or activities that increase aquifer recharge, reduce aquifer depletion, and increase streamflow

2. Remediate or mitigate threats to drinking water

3. Promote the goals and objectives of approved integrated management plans or ground water management plans

4. Contribute to multiple water supply management goals including flood control, reducing threats to property damage, agricultural uses, municipal and industrial uses, recreational benefits, wildlife habitat, conservation, and preservation of water resources

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Goals of Fund

5. Assist municipalities with the cost of constructing, upgrading, developing, and replacing sewer infrastructure facilities as part of a combined sewer overflow

6. Provide increased water productivity and enhance water quality

7. Use the most cost-effective solutions available

8. Comply with interstate compacts, decrees, other state contracts and agreements and federal law

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Available Avenues to Meet Goals

1. Research, data and modeling

2. Rehabilitation or restoration of water supply infrastructure, new water supply infrastructure or water supply infrastructure maintenance or flood prevention for the protection of critical infrastructure

3. Conjunctive management, storage and integrated management of ground water and surface water

4. Compliance with interstate compacts or agreements or other formal state contracts or agreements or federal law

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NRC Ranking Criteria

1. Remediates or mitigates threats to drinking water;
2. Meets the goals and objectives of an approved integrated management plan or ground water management plan ;
3. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow ;
4. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources;
5. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents
6. Is cost-effective;
7. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts of agreements or federal law;

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NRC Ranking Criteria

8. Improves water quality;
9. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity ;
10. Has a local jurisdiction with plans in place that support sustainable water use ;
11. Addresses a statewide problem or issue;
12. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources ;
13. Contributes to watershed health and function ;
14. Uses objective described in the annual report and plan of work for the state water planning and review process issued by the department

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Current Status

- Commission and DNR both required to promulgate rules and regulations
  - Held many meetings and informal informational sessions
  - Formal hearings held on each set of rules
    - DNR rules – April 16 (review of applications and fund administration)
    - Commission rules – April 28 (fund governance, application ranking and scoring)

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Current Status

- Commission reviews hearing testimony
  - If no substantive changes, Commission will adopt draft rules and submit for Attorney General Office and Governor's Office approvals and posting by Sec. of State
  - Earliest application submittal estimated November 2015

- If substantive changes to rules, redraft and repeat process of obtaining approvals to hold new hearing
  - Earliest application submittal estimated March 2016

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Summary

- Nebraska has a solid foundation of water planning
- Water planning is a continual process
- Challenges sometimes present opportunities
- Sustainability Funding will provide additional resources to leverage opportunities

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